# CRETACEOUS FAUNAS FROM ZULULAND AND NATAL, SOUTH AFRICA
# A NEW SEXTUBERCULATE TEXANITID

By

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(With 7 figures)

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## ABSTRACT

*Plesiotexanites* (*Eutexanites*) *sextuberculatus* sp. nov. from the Lower Santonian of Zululand is described. Ornament and ontogeny are basically that of *Plesiotexanites*, except that a sixth row of tubercles is added through division of the original umbilical row. The sextuberculate ornament is unique amongst the ammonite subfamily Texanitinae, but appears to have been an evolutionary cul-de-sac.

## CONTENTS



## INTRODUCTION

Subsequent to the authors' (Klinger & Kennedy 1980) monographical description of the southern African representatives of the ammonite subfamily Texanitinae Collignon, 1948, an as yet undescribed form was discovered in the course of routine curatorial duties and fieldwork. This new form differs from all known texanitine material in possessing six rows of tubercles in the adult stage, and merits description as a new subgenus and species of the genus *Plesiotexanites* Matsumoto, 1970.

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## SYSTEMATIC DESCRIPTION

Superfamily ACANTHOCERATACEAE de Grossouvre, 1894

Family **Collignoniceratidae** Wright & Wright, 1951

Subfamily Texanitinae Collignon, 1948

Genus *Plesiotexanites* Matsumoto, 1970

Subgenus ***Eutexanites*** Klinger & Kennedy nov.

*Type species*

*Plesiotexanites* (*Eutexanites*) *sextuberculatus* Klinger & Kennedy sp. nov., from the Lower Santonian of Zululand.

*Diagnosis*

The first ornamented stage is trituberculate, with umbilical, ventrolateral and external tubercles. In later stages the bullate ventrolateral tubercles divide into marginal and submarginal rows. In addition, the umbilical tubercles divide into two rows, with the ventral row strongest. With increasing diameter, the two umbilical rows and the marginal and submarginal rows migrate further apart, whilst at the same time, a faint lateral tubercle appears. In the final stages of growth observed, all rows of tubercles are more or less equidistantly spaced on the flanks. The keel is undulating. The suture is of the simple collignoniceratid type.

*Occurrence*

Lower Santonian of Zululand only.

***Plesiotexanites* (*Eutexanites*) *sextuberculatus*** sp. nov.

Figs 1–5, 7

*Holotype*

BMNH–C82427 from the St Lucia Formation, Santonian I or II at locality 86, a line of concretions striking across the foreshore exposures 750 m north of Picnic Point, south-western shores of False Bay, east of Hluhluwe, Zululand, South Africa.

*Material*

SAM–PCZ5925–6, both from the St Lucia Formation, Santonian I at locality 73, a degraded river cliff along the north banks of the Mzinene River, north-north-east of Hluhluwe, Zululand, are tentatively referred to the species.

*Derivation of name*

Refers to the six rows of tubercles in the adult stage.

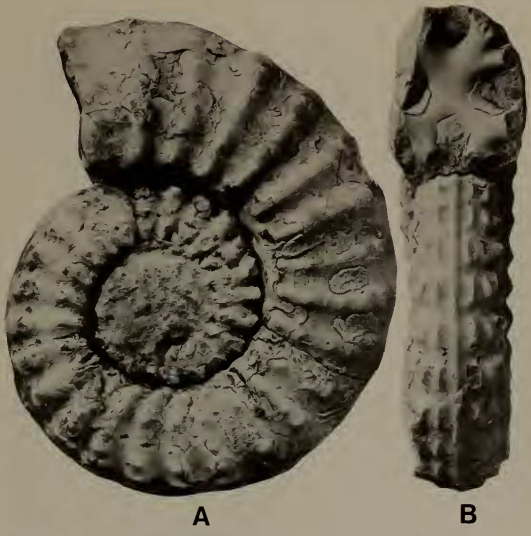


Fig. 1. A–B. *Plesiotexanites* (*Eutexanites*) *sextuberculatus* sp. nov. Holotype, BMNH C82427, from the St Lucia Formation, Lower Santonian, locality 86, Zululand. × 1.

*Dimensions*

All measurements are in millimetres. D = diameter, Wb = whorl breadth, Wh = whorl height, U = umbilical diameter, T = number of tubercles per whorl.

Figures in parentheses are dimensions expressed as a percentage of the diameter.

| | *D* | *Wb* | *Wh* | *Wb : Wh* | *U* | *T* |
|---|---|---|---|---|---|---|
| BMNH–C82427 at | 37,0 | 15,0(40,5) | 13,0(35,1) | 1,15 | 16,0(43,2) | 20 |
| at | 75,0 | 20,0(26,7) | 25,0(33,3) | 0,8 | 34,0(45,3) | 24 |
| at | 90,0 | 25,0(27,8) | 29,0(32,2) | 0,86 | 41,0(45,6) | 25 |
| SAM–PCZ5923 at | 78,0 | 29,0(37,2) | 31,0(39,7) | 0,93 | 28,0(35,9) | 30 |

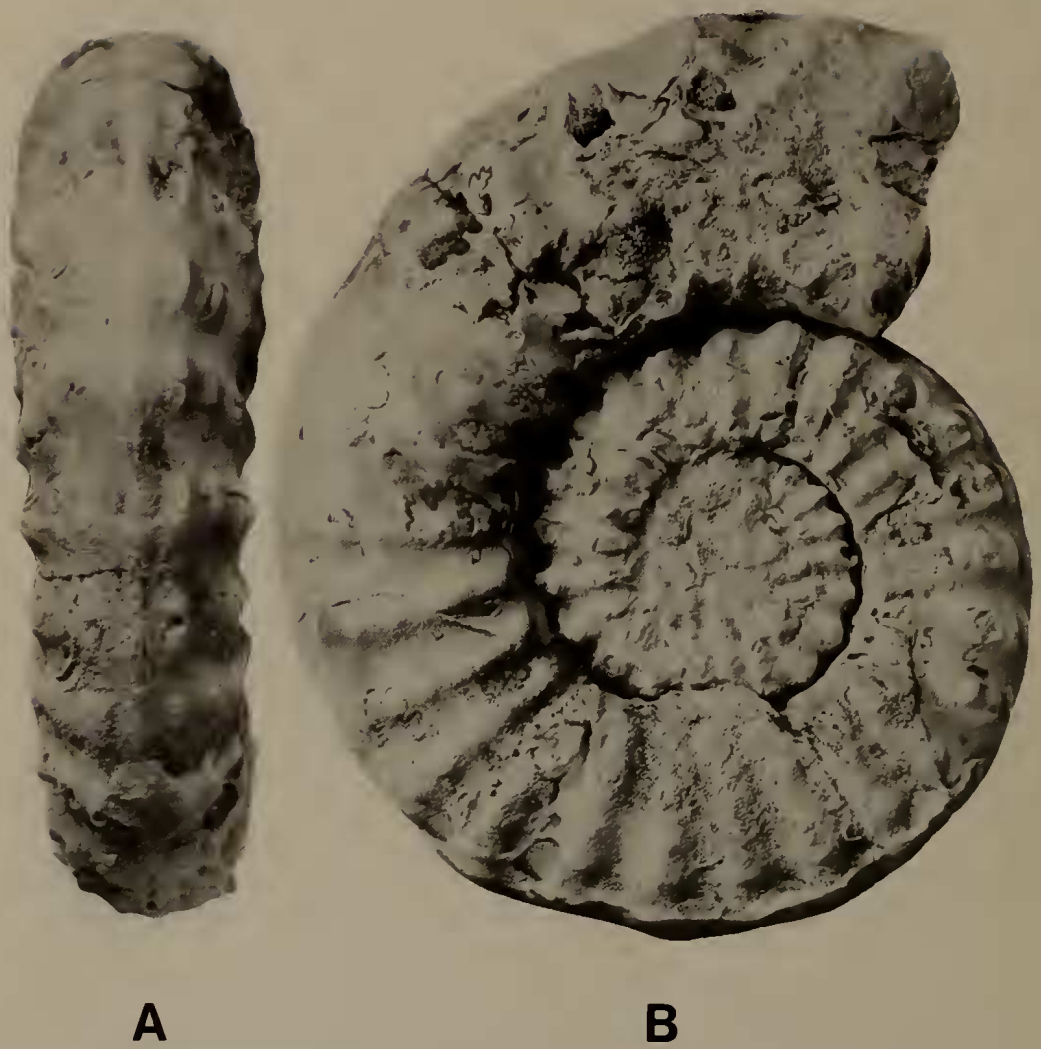


Fig. 2. A–B. *Plesiotexanites* (*Eutexanites*) *sextuberculatus* sp. nov. Holotype, BMNH C82427, from the St Lucia Formation, Lower Santonian, locality 86, Zululand. × 1.

*Description*

This is a widely umbilicate species, with umbilical width increasing slightly during ontogeny from 43 to 45 per cent. Whorl overlap is minimal and in consequence the dorsal zone of impression is very shallow. The whorl section varies considerably during ontogeny, from slightly broader than high and rounded rectangular on the innermost whorls, through rounded quadrate to subtrigonal ovoid, higher than wide, with gently rounded flanks converging to a venter which is narrower than the dorsum (Fig. 4A–C).

At the earliest diameter preserved (approximately 22 mm), there are already three rows of tubercles on each flank (Fig. 4E–G), with radially pinched umbilical, prominent ventrolateral and weak, clavate external tubercles. The

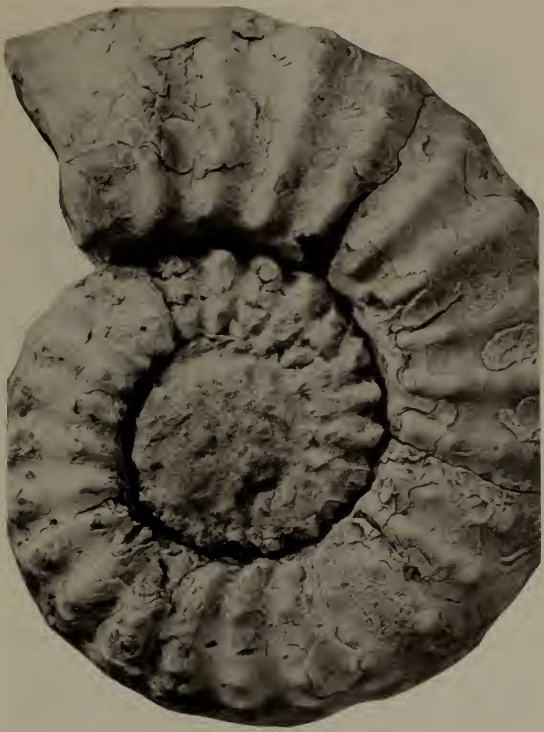

Fig. 3. *Plesiotexanites* (*Eutexanites*) *sextuberculatus* sp. nov. Holotype, BMNH C82427, from the St Lucia Formation, Lower Santonian, locality 86. × 1,6.

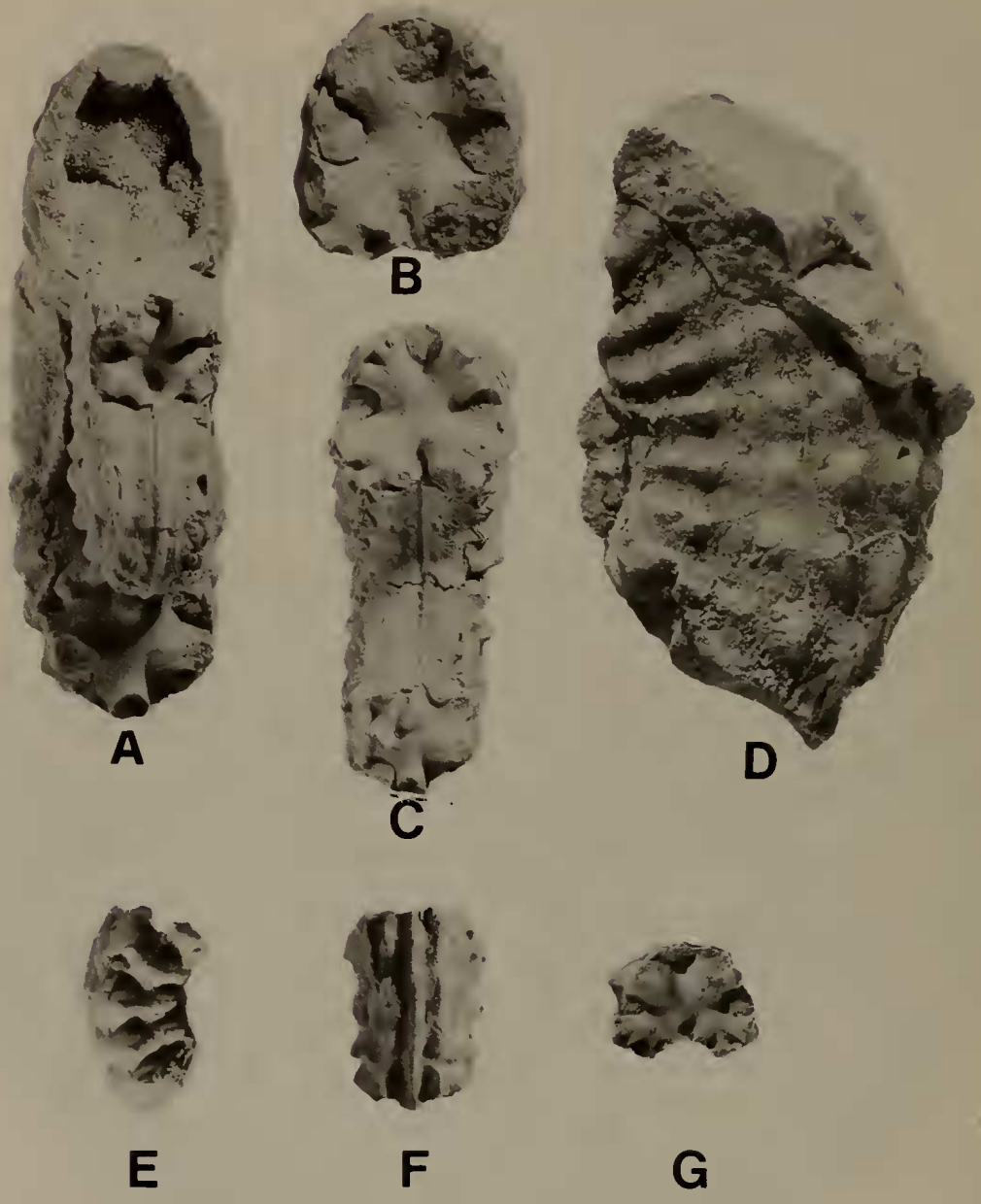


Fig. 4. *Plesiotexanites* (*Eutexanites*) *sextuberculatus* sp. nov. A–C. Holotype, BMNH C82427, before repair, to illustrate the ontogentic changes in whorl section. D. SAM–PCZ5925 outer whorl of a specimen with indistinctly developed double umbilical tubercles, from St Lucia Formation, Lower Santonian, locality 73, Zululand. E–G. SAM–PCZ5926 with '*Paratexanites*' inner whorls. Horizon and locality as for D. All × 1.

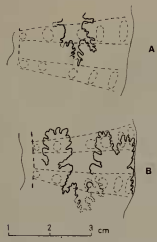


Fig. 5. *Plesiotexanites* (*Eutexanites*) *sextuberculatus* sp. nov. Holotype, BMNH C82427 from the St Lucia Formation, Lower Santonian, locality 86, Zululand. Part of external suture lines.

keel, at this diameter, is already well developed and entire. At a diameter of 40 mm the ventrolateral tubercles already show distinct signs of splitting in two, although still joined by a common base. In addition, the umbilical tubercles move outwards from the umbilicus and also show signs of splitting in two. At this stage the ventral half of the umbilical tubercle appears strongest. Beyond this diameter, crenulations appear on the keel.

With increasing diameter the division of the ventrolateral and umbilical tubercles becomes more and more marked, and at a diameter of about 75 mm the division is completed. Also at this stage faint indications of a lateral row of tubercles appear, situated slightly closer to the submarginal than inner umbilical tubercle. Up to this stage all the ribs are single and more or less radial, but beyond this, slight indications of forward curvature of the ribs develop.

The holotype is still septate at a diameter of 102 mm, and at the greatest preserved diameter six distinct rows of tubercles are present, although the lateral row is still weakest. Spacing of the rows of tubercles is virtually equidistant, each being situated on one-sixth of the flanks.

Part of the external suture is shown in Figure 5. It is of the normal collignoniceratid type with little-incised elements.

*Discussion*

The description of the species is based mainly on the holotype (Figs 1–3, 5, 7). Paratype SAM–PCZ5926 (Fig. 4E–G) is an immature individual, whereas SAM–PCZ5925 (Fig. 4D) differs from the holotype in being slightly more inflated, narrower umbilicate and does not have as distinct outer umbilical tubercles in the adult stage.

Both sides of the holotype show the distinct progressive division of the umbilical row of tubercles. Thus the possibility that we might here be dealing with a pathological specimen is most unlikely.

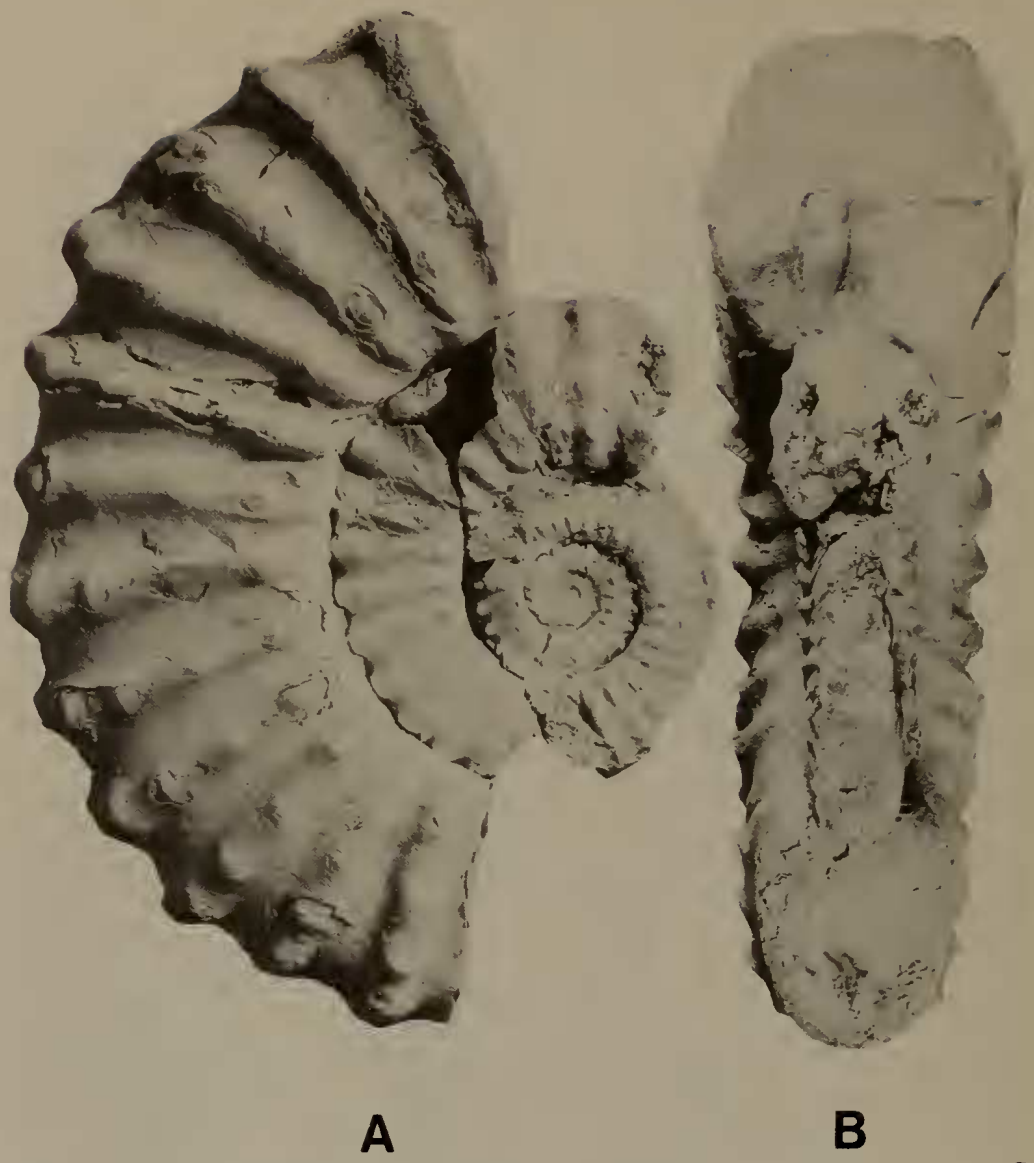


Fig. 6. A–B. *Plesiotexanites* (*Plesiotexanites*) *collignoniforme* Klinger & Kennedy, SAS Z1790*a*, from the St Lucia Formation, Lower Santonian, locality 86, Zululand. Specimen to illustrate similarity to *P.* (*Eutexanites*) *sextuberculatus* sp. nov.

Apart from the division of the umbilical row of tubercles, the ontogenetic development of the ornament, and to a lesser extent the whorl section and evolute coiling are characteristic of *Plesiotexanites*, hence it is advisable to separate this species from *Plesiotexanites* s.s. at subgeneric level only. Both *Plesiotexanites* s.s. and *P.* (*Eutexanites*) have an early trituberculate stage, then pass through a '*Paratexanites*' stage when the ventrolateral tubercle starts dividing, and eventually acquire a lateral tubercle. The diagnostic difference is

that *P.* (*Eutexanites*) acquires an additional row of tubercles through division of the umbilical row of tubercles at a relatively early stage of growth.

Comparison with other texanitine species is simple by virtue of the presence of this sixth row of tubercles. All other known taxa have five or less rows.

Incipient doubling of the umbilical row of tubercles has been noted in *Plesiotexanites kawasakii* (Kawada) (see Matsumoto 1959: 124; 1970: 282), but none of the specimens shows a distinct division of the umbilical tubercles into two clearly separated rows as in the present species.

In Zululand the closest ally in overall morphology is *Plesiotexanites* (*P.*) *collignoniforme* Klinger & Kennedy, which occurs at the same biostratigraphic level in Zululand at locality 85 (see Kennedy & Klinger 1975: 294), in close proximity to locality 84 where the holotype of *P.* (*E.*) *sextuberculatus* sp. nov. was found.

Relative proportions of the two species are virtually identical, as a comparison of the dimensions of the holotypes shows:

| | *D* | *Wb* | *Wh* | *Wb : Wh* | *U* | *T* |
|---|---|---|---|---|---|---|
| *P.* (*E.*) *sextuberculatus* | 90,0 | 25,0(27,8) | 29,0(32,2) | 0,86 | 41,0(45,6) | 25 |
| *P.* (*P.*) *collignoniforme* | 220,0 | 58,0(26,1) | 67,0(30,2) | 0,87 | 103,0(46,4) | 37 |

In *P.* (*P.*) *collignoniforme* the umbilical tubercle shows signs of elongation over the umbilical wall, and also ventral migration (fig. 6), but none of the specimens has a distinct division of this tubercle as in *P.* (*E.*) *sextuberculatus*. *P.* (*P.*) *collignoniforme* acquires the lateral tubercle at an earlier diameter than *P.* (*P.*) *sextuberculatus*, and also retains the '*Parabevahites*' arrangement of the submarginal and marginal tubercles to a greater diameter. The co-occurrence of the two species at the same stratigraphic level and their great similarity suggest genetic affinity and possible derivation from a common ancestor, probably *Paratexanites pseudotricarinatum* Klinger & Kennedy. In the latter species there is already a distinct elongation of the umbilical tubercle in some specimens. Paratype SAM–PCZ5925 (Fig. 4D), with more inflated section, narrower umbilicus and less clearly defined doubled umbilical tubercles, may be regarded as intermediate between *Paratexanites pseudotricarinatum* and *Plesiotexanites* (*E.*) *sextuberculatus*.

Judging by the lack of further sextuberculate forms in southern Africa, it appears that this development was an evolutionary cul-de-sac.

Multiplication of umbilical tubercles is known to occur in two other texanitine species in southern Africa; *Plesiotexanites* (*P.*) *matsumotoi* Klinger & Kennedy, and *Menabites* (*Australiella*) *australis* (Besairie 1930), but here multiplication occurs through intercalation rather than actual division and there is no genetic relationship.

A minor point to note is that the sextuberculate ornament does not fit the numerical annotation for describing the rows of tubercles in texanitid species as employed by the authors (Klinger & Kennedy 1980, fig. 1), Young (1963: 37, text-fig. 6), and Collignon (1948: 55(10)). Rather than change the whole system,

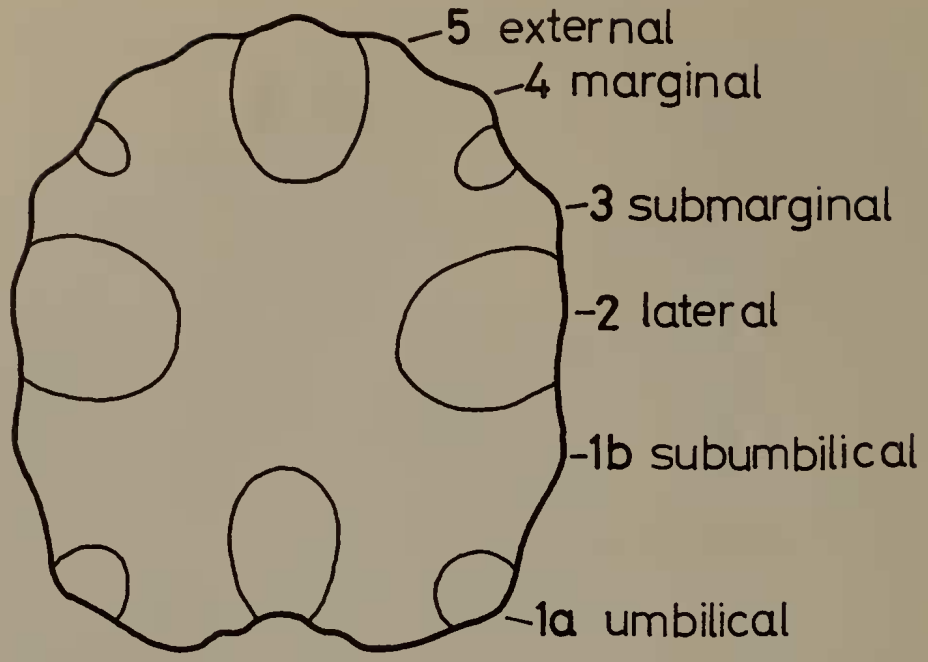


Fig. 7. *Plesiotexanites* (*Eutexanites*) *sextuberculatus* sp. nov. Holotype, BMNH C82427, from the St Lucia Formation, Lower Santonian, locality 86, Zululand. Whorl section with annotation here employed.

it is here suggested to refer to the two umbilical rows of tubercles as umbilical and subumbilical, or, if described numerically, as 1*a* and 1*b* respectively (see Fig. 7).

*Occurrence*

Lower Santonian of Zululand.

## ACKNOWLEDGEMENTS

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